

## *200W-600 W series*

# User- Manual

## wind/solar hybrid Controller



- Model No.: SSWC-06-1224
- Version: 5.0

Thank you very much for selecting our product!

This manual offers important information and suggestions with respect to installation, use and troubleshooting, etc. Please read this manual carefully before using the product and pay attention to the safety recommendations in it

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## 1. Important Safety Operation Information

This manual contains important safety, installation and operating instructions for controller.



### WARNING:

- Reverse connection of positive (+) and negative (−) is prohibited !
- Short-circuit of positive (+) and negative (−) is prohibited !
- DC supply, switching power supply or motor driven generator to simulate the wind generator to charge testing is prohibited !



### CAUTION:

- If your battery voltage lower than 9V, connect to controller is prohibited! Controller was damaged much possibly caused by this occurrence.
- Solar panel and loading rated power do not higher than controller rating accordingly.

## 2. General Safety Information

- Please don't use low quality battery to avoid leakage, rust or burn.
- Please don't use thin or low quality cable to avoid leakage or fire.
- Do not open cover and maintain personally.
- Keep it away from water, moist, rain, severe dust, shaking, corrosion and
- Intensive or under intense electromagnetic interference.
- This machine prohibited around the place with any flammable, explosive and dangerous goods.
- Keep any symbols on the controller complete. To avoid accidents, keep it away from this children.

## 3. General Description

The friendly wind/solar hybrid controller is specially designed for high-end small-scale wind/solar hybrid system and especially suitable for wind/solar hybrid street light system and wind/solar hybrid monitoring system.

Topology Diagram



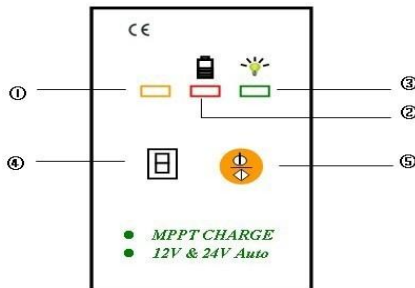
#### 4. Product features

- MPPT technology to optimize using the wind energy. (Optional)
- Boost circuit designed. (Optional)
- 12V/24V System Automatic Recognition function.(Optional)
- Be able to use for 200W-600W wind turbine with high compatibility.
- Digital design, module structure, stable and reliable.
- Dual-line output, light sensor and timer functions, morning lighting, constantly output 24hours.
- User can adjust setting of system parameters as timer.

#### 5. Protection Functions

- Solar cells reverse charging, solar cells anti-reverse connection
- Battery over-charging, over-discharge, battery anti-reverse connection.
- Over-load, load anti-reverse connection and load short circuit protection
- Wind turbine current and voltage limited, rotation limited and brake.

#### 6. Panel of controller illumination



- ①--- Charge indication LED (green) Blinking in charging situation.
- ②---battery LED (red) over-discharge will lighting,, Blinking mean over-charge of battery.
- ③--- O/P indication LED (green) . This LED lighting mean DC power output normally. Blinking mean DC-loading power watts exceed rated or load short circuit.
- ④--- digitron value(hours) . if be“5”, meaning DC output duration is 5hours. Then it going next half-power process or cut-off output supply. (according to type you are using)
- ⑤--- Button. For setting value of digitron. Use method as below:
- setting: press 5secs. The digitron will be blinking, meaning enter in

setting condition. press one time, the value will be plus +1. if right down point is lighting, this value will plus +10.

- save: stop press key, then 10sec. later, the digitron will stop blinking to be lighting, this meaning saving successfully. Then the digitron will be turn off about 15sec. later.
- Digitron will be lighting once connection completed. And turn off after 20sec. if you want to look value of setting, please short press the key.
- Setting value range: 0-17 (hours) .

\*\* IF YOU BUY CONSTANT OUTPUT FOR YOUR MONITOR SYSTEM, PLEASE IGNORE ABOVE ITEM SETTING



### **CAUTION:**

When you have completed setting, please to disconnection battery aim to turn off controller, then after 10seconds, re-start connection of battery to turn on controller. This process is intent to make sure the program running in modified setting condition.


## **7. Installation Instructions**

### **7.1 General Installation Notes**

- Read through the entire installation section first before beginning installation.
- Be very careful when working with batteries. Wear eye protection. Have fresh water available to wash and clean any contact with battery acid.
- Uses insulated tools and avoid placing metal objects near the batteries.
- Explosive battery gasses may be present during charging .Be certain there is sufficient ventilation to release the gasses.
- Avoid direct sunlight and do not install in locations where water can enter the controller.
- Loose power connections and /or corroded wires may result in resistive connections that melt wire insulation, burn surrounding materials, or even cause fire. Ensure tight connections and use cable clamps to secure cables and prevent them from swaying in mobile applications.
- Use with Gel, Sealed or Flooded batteries only.
- Battery connection may be wired to one battery or a bank of batteries. The following instructions refer to a singular battery, but it is implied that the battery connection can be made to either one battery or a group of batteries in a battery bank.

Select the system cables according to  $3A/mm^2$  current density.

## 7.2 Mounting

 **NOTE:** When mounting the controller, ensure free air through the controller heat sink fins. There should be at least 150mm of clearance above and below the controller to allow for cooling. If mounted in an enclosure, ventilation is highly recommended.

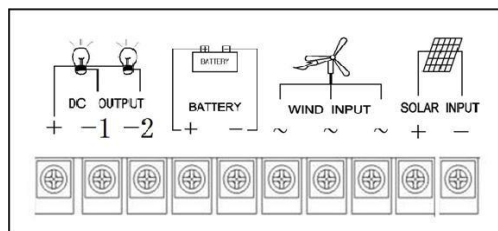


**WARNING:** Risk of explosion! Never install the controller in a sealed enclosure with flooded batteries! Do not install in a confined area where battery gas can accumulate.

- Step 1: Choose Mounting Location: Locate the controller on a vertical surface protected from direct sun, high temperature, and water.
- Step 2: Check for Clearance: Place the controller in the location where it will be mounted. Verify that there is sufficient room to run wires and that there is sufficient room above and below the controller for air flow
- Step 3: Mark Holes: Use a pencil or pen to mark the four (4) mounting hole locations on the mounting surface.
- Step 4: Drill Holes: Remove the controller and drill four sizeable holes in the marked locations.
- Step 5: Secure Controller: Place the controller on the surface and align the mounting holes with the drilled holes in step 4. Secure the controller in place using the mounting screws.

## 7.3 System connection with controller

A recommended connection sequence has been provided for maximum safety during installation.

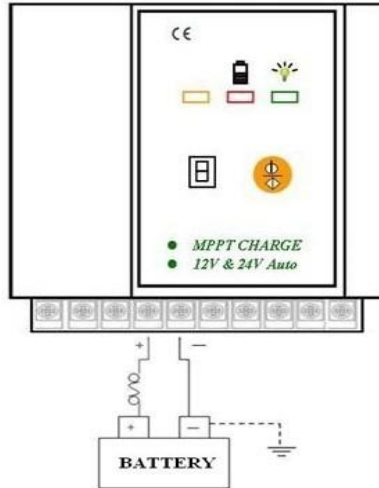


### Step 1: Battery Wiring



#### **WARNING:**

- Risk of explosion or fire! Never short circuit battery positive (+) and negative (−) or cables
- If your battery voltage lower than 9V, connect to controller is prohibited! Controller was damaged much possibly caused by this occurrence



**CAUTION:**

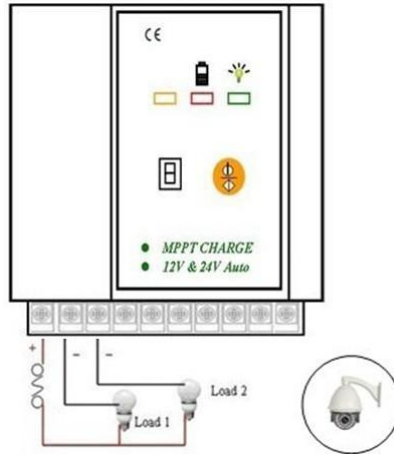
1. Before connecting the battery, please measure the battery voltage.
2. For 24V system, batteries voltage must be greater than 18V.
3. For 12V system, battery voltage must be greater than 9V.

The controller will identify system by detection of this parameter. If the battery voltage is between 16V-17V, the controller is in discriminant blind spot, the controller will not work normally, please be noted.

Wire an in-line fuse holder no more than 150mm from the battery positive terminal. Confirm the connection are correct.

**Step 2: Loading Wiring**

- The controller load output can connect DC electronic devices of which rated voltage is same as battery's. Device will provide battery voltage to the loads.
- DC loading could be LED lamp or monitor devices etc.



1. Connect load1 positive (+) and negative (-) to the controller related terminals and connect load2 positive (+) and negative (-) to the controller related terminals accordingly.
2. The load terminals may exist voltage, connect carefully to avoid short circuit.
3. An in-line fuse holder should be wired in series in the load positive (+) or negative (-) wire as shown. Do not insert a fuse at this time.
4. Confirm the connection are correct.

If wiring the load connection to a load distribution panel, each load circuit should be fused separately. The total load draw current should not exceed the 10A load rating.

### Step 3: Solar Module Wiring



#### **WARNING**

Risk of electric shock! Exercise caution when handling solar wiring. The solar module(s) high voltage output can cause severe shock or injury. Cover the solar module(s) from the sun before installing solar wiring.

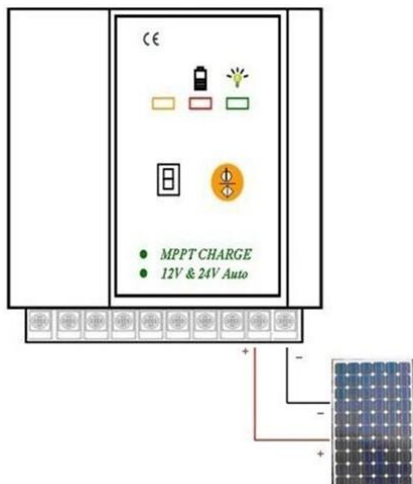


#### **CAUTION:**

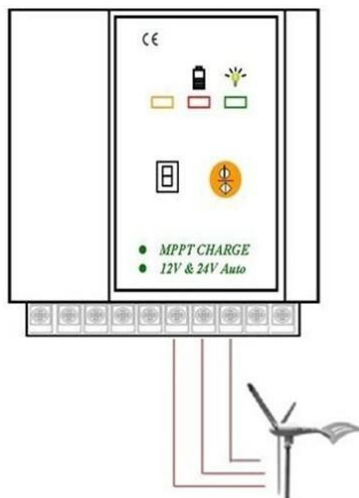
1. If you can not confirm the scientific and rational PV module connection by series or parallel way, please contact the manufacturer of controller.
2. The controller can be applied to the single crystal silicon, polycrystalline silicon, thin-film photo voltaic group



3. PV groups open circuit voltage (**V<sub>oc</sub>**) do not higher than rated battery bank voltage 1.8times.
4. PV groups operation voltage (**V<sub>mp</sub>**) do not lower than rated battery bank voltage 1.2times.



#### Step 4: Wind-turbine (PMG) Wiring

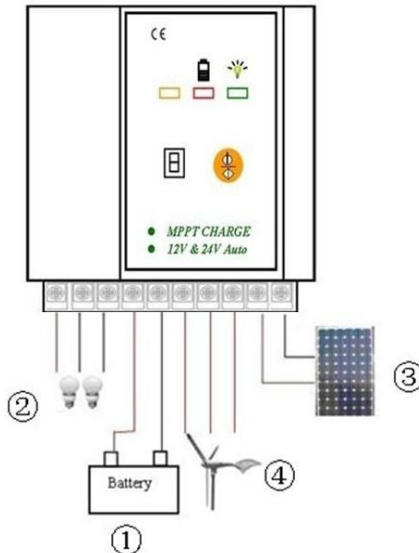


Please connect wind-turbine to controller related terminals .

- The wind-turbine rated voltage (@ rated wind-speed level) should be equal to voltage of battery bank.
- If your wind-turbine output is DC power, +/- polarity wire can connect to 2 of whereby 3 terminals be optional.

### Step 5: Confirmation for Wiring

Double-check the wiring in step1 through 5. Confirm correct polarity at each connection. Verify that all 10 power terminals are tightened.



### Step 6: Power-up sequence after confirmation of connection

1. Turn-on battery
2. Turn-on solar panel
3. Turn-on wind-turbine
4. Turn-on DC loading
5. Turn-on switch power for city-electric (if be this mode)



### CAUTION

if you would take down system as need, must be comply with following sequence.

1. Remove wind-turbine wiring firstly!
2. Remove solar panel wiring
3. Remove DC load wiring
4. Remove batteries wiring lastly

1. When the battery power up, the controller starts, three LED will be blinking simultaneously 3 times. The controller are in the initialization and detection device status of each system.

2. Delay of about one minute later, the controller output indicator LED to light. At the moment indicates have the DC power output (when not connected to the solar panels or solar panel voltage below 6V case).

If the controller does not start properly, or don't have the output DC power supply after the normal start. Please check the following

1). Please confirm if the battery positive and negative have connections correctly, solidly.

2). Please use a multi-meter to measure if the battery voltage is of 9V or more.

3). After the controller connected to battery, there is 1 minutes delay output DC power supply

4). When the battery is in discharge, the controller will cut off the DC power supply output

5). Street lighting system, if on day time, no DC power output is a normal phenomenon.

### 8. Controller output DC power illumination

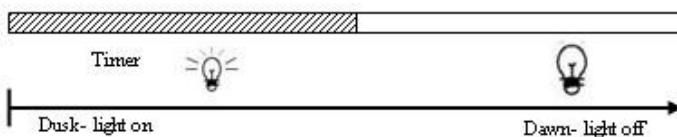
This device be able to do following 8 terms output ways, please requested which type are your expectation before you buy.

\* NOW, YOUR ARE USING TYPE IS ☒ ITEM.

☐ (A) output 1th line and 2nd line all are constant output DC power for monitor device.



☐ (B) 1th line output be: lighter on/off; 2nd output be: lighter on + timer off

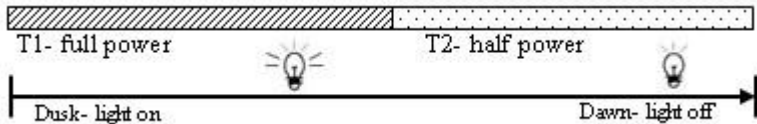


if you set timer is 15 or above, 2<sup>nd</sup> output will same with 1th output. It is meaning lamp on/off be controlled by light sensor.

- ☐ (C) 1th and 2nd output are: lighter on + timer off

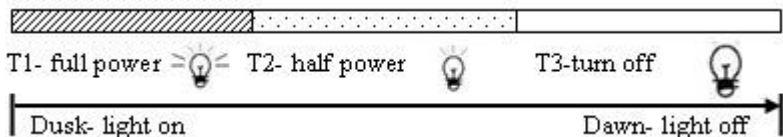
if you set timer is 15 or above, timer will be invalid. It is meaning lamp on/off be controlled by light sensor only.

- ☐ (D) 1th line output be full-power (lighter on/off) ; 2nd line output be: full-power (timer off) + half-power



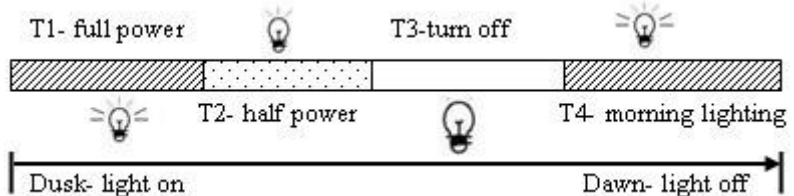
You could request 1th and 2<sup>nd</sup> output will be same, but need note us before order. We will set it before out of factory.

- ☐ (E) 1th line output full power (lighter on/off); 2<sup>nd</sup> line output be: full power (timer off) + half power + turn off



You could request 1th and 2<sup>nd</sup> output will be same, but need note us before order. We will set it before out of factory.

- ☐ (F) 1th line output be full power (lighter on/off); 2<sup>nd</sup> line output be: full power (timer off) + half power + turn off + morning lighting



You could request 1th and 2<sup>nd</sup> output will be same, but need note us before order. We will set it before out of factory.

## 9. Performance Parameters

### 9.1 Wind generator control set-up definition:

Rated Wind Turbine Power	200W – 600W
Wind Turbine brake voltage (12V/24V)	15VAC / 25VAC
Wind Turbine brake current (12V/24V)	10A / 20A

### 9.2 PV panel set-up definition

Max PV power (12v/24v)	150W / 300W
system max open circuit voltage (12V/24V)	24.0V/ 48.0V
Solar panel max charge current	12.5A

### 9.3 Battery management definition

Over-discharge Voltage (12V/24V)	10.5V / 20.0V
Over-discharge Recovery Voltage 12V/24V)	12.0V / 24.0V
Over-charge Voltage (12V/24V)	15.0V / 30.0V
Over-charge Recovery Voltage (12V/24V)	13.5V / 27.0V

### 9.4 Output Set-up function:

Each Line Output Max. Current	5A
Each Line Output rated Power (12V/24V)	60W / 120W
Dusk and dawn threshold voltage (VsTH)	6.0V

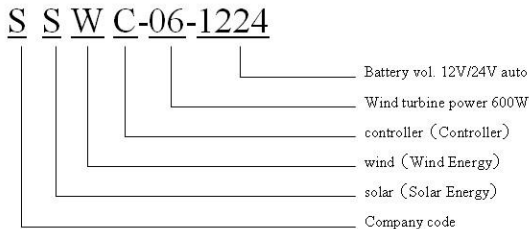
### 9.5 Product Conventional parameter

Display	LED
Self-consumption	≅ 30mA
Temperature-compensation coefficient	-35mV/°C (25°C ref.)
Ambient temp. range	-30°C to +55°C
Store temp. range	-35°C to +80°C
Humidity range	10% - 90% (NC)
Altitude work	≤5000 meters above sea level
Protection class	IP55

## 10. About time-delay illumination

<i>Delay items</i>	<i>Duration</i>
DC output (lighting) after Power on	60 seconds approximately
Dusk to light lamp (NTTV) for output	60 seconds approximately
Dawn to turn-off lamp (DTTV) for output	60 seconds approximately
Over-charge protection on charge	10 seconds approximately
Over-charge recovery on charge	15 minutes approximately
Over-discharge cut-off output	10 seconds approximately
Over-discharge recovery for output	2 minutes approximately
Wind-turbine brake	1 hours approximately

## 11. Model Description



If be monitor type, the mode would be SSWC-06-1224-C

## 12. Maintenance

The following inspections and maintenance tasks are recommended at least two times per year for best controller performance.

- Check that the controller is securely mounted in a clean and dry environment.
- Check that the air flow and ventilation around the controller is not blocked. Clear all dirt or fragments on the heat sink.
- Check all the naked wires to make sure insulation is not damaged for serious polarization, frictional wear, dryness, insects or rats etc. Maintain or replace the wires if necessary.
- Tighten all the terminals. Inspect for loose, broken, or burnt wire connections.
- Confirm that all the system components are ground connected tightly and correctly.
- Confirm that all the terminals have no corrosion, insulation damaged, high temperature or burnt/discolored sign, tighten terminal screws to the suggested torque.
- Check and confirm that lightning arrester is in good condition. Replace a new one in time to avoid damaging of the controller and even other equipments.

### 13. Troubleshooting Guide:

	Fault Phenomenon	Reason	Solution
1	Connected to the battery, the controller does not work	The battery voltage is too low	Charger to charge the battery or replace the battery
2	Connected to the battery, the controller does not output	The battery voltage is below the release point	Normal, wait for the system to charge to the recovery point
		Access photovoltaic panels, switch on PV	Remove the photovoltaic panels
		Controller is 1 minute output delay (battery voltage is normal)	Normal
3	The controller is not charging	The voltage of Wind turbine and photovoltaic panels too low	Observe When Wind or PV is strong enough
		The battery voltage is too high, has been in the overvoltage condition	Normal
4	Still no output when Batteries rose to a recovery point ,from over-discharge point	The controller has two minutes, delayed output	observe and test after 1 minute
5	3 LED are blinking simultaneously	Wind-turbine braking protection	Normal
6	The speed of the wind turbine is very low	The wind speed is too low	Observe When wind speed is high
		The battery is not connected, the controller starts the open-circuit protection function	Securely connected again
		The battery voltage is too high, has been in the brake condition	Observe after the Battery discharge

### 14. Warranty and after Sales Service

The charge controller is warranted to be free from defects for a period of ONE (1) years from the date of shipment to the original end user. We will, at its option, repair or replace any such defective products.

- **Claim procedure:**

Before requesting warranty service, check the Operation Manual to be certain that there is a problem with the controller. Return the defective product to us with shipping charges prepaid if problem cannot be solved. Provide proof of date and place of purchase. To obtain rapid service under this warranty, the returned products must include the model, serial number and detailed reason for the failure, the module type and size, type of batteries and system loads. This information is critical to a rapid disposition of your warranty claim.

• **This warranty does not apply under the following conditions:**

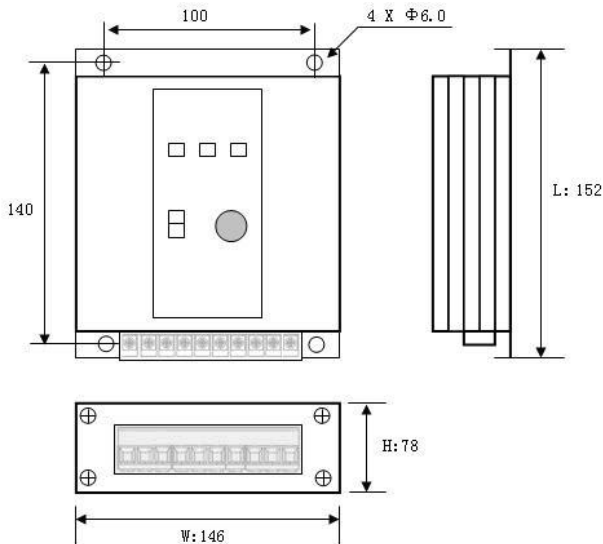
1. Damage by accident, negligence ,abuse or improper use.
2. PV or load current exceeding the rating of product.
3. Unauthorized product modification attempted repair.
4. Damage occurring during shipment.
5. Damage results from acts of nature such as lightning, weather extremes.
6. Irreclaimable mechanical damage.

## 15. Declare:

The product has applied for patent protection, counterfeiting will be subject to legal sanctions. Our Company reserves the right to change products and without notice when products update.

## 16. Dimensions (mm)

Weight: 1.0KG





## **17: Accessories (Option)**

If your buy unit isn't this type mode, please ignore following guide.

1. Install the data-communication wire if required.
2. Refer to the instructions provided for detailed installation procedures of software guide.

